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ABSTRACT

The sixth nationwide investigation of public playgrounds by the Consumer Federation ofAmerica (CFA) and the State Public Interest Research Groups (PIRGs) found that amajority of U.S. playgrounds pose hidden threats to youngsters. From March-May 2002, the State PIRGs and other CFA member organizations investigated 1,037 playgrounds in 36 states (Alabama, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, Vermont, Washington, and Wisconsin) and Washington, DC, to determine the current safety conditions of public playgrounds. The survey gathered data on falls, fall zones, equipment height, swings, head entrapment hazards, entanglement hazards, hazardous equipment, chipping or peeling paint, and pressure-treated wood, as well as on local and state activity in the area of playground regulations and community advocacy. Overall, this year's survey shows improvements, in particular a continued decline in the number of playgrounds with hard surfaces under and around all play equipment. (Appendices contain the survey, a parent checklist for playground safety, and state survey results.) (EV)

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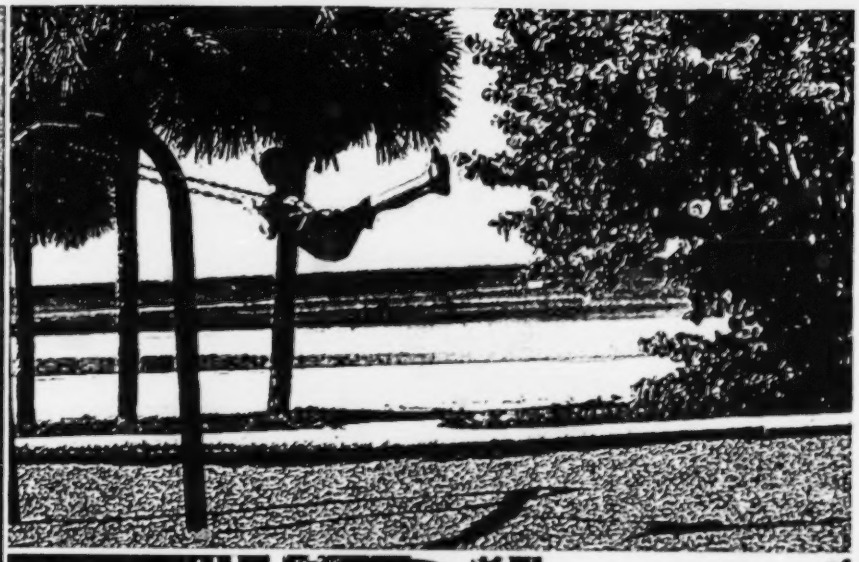

The Sixth Nationwide Safety Survey of Public Playgrounds

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PLAYING IT SAFE:
THE SIXTH NATIONWIDE SAFETY SURVEY OF PUBLIC PLAYGROUNDS

The Consumer Federation of America
U.S. Public Interest Research Group Education Fund
June 2002

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EXECUTIVE SUMMARY

The sixth nationwide investigation of public playgrounds by Consumer Federation of America (CFA) and the State Public Interest Research Groups (PIRGs) found that a majority of American playgrounds pose hidden threats to our nation's youngsters.

Too many children are getting hurt and killed on our playgrounds. According to the most recent data from the U.S. Consumer Product Safety Commission (CPSC), in 2001 almost 190,000 children were injured seriously enough on public playground equipment to require emergency room treatment. On average, 17 children die each year playing on playgrounds. Many of these deaths and injuries can be prevented if playgrounds — from equipment design to surfacing content to the playground's layout — were designed with safety in mind.

In June 1998, CFA released the third edition of its "Report and Model Law on Public Play Equipment and Areas," a blueprint for designing, building and maintaining public playgrounds. CFA's blueprint details the hazards on playgrounds that lead to injuries and presents safety and design criteria that can reduce deaths and injuries. Since 1992, the State PIRGs and CFA have documented the threats posed to child safety on playgrounds by surveying playgrounds across the country and detailing the hazards posed by inadequate surfacing, equipment deficiencies, and other problems.

From March-May 2002, the State PIRGs and other CFA member organizations investigated 1,037 playgrounds in 36 states (Alabama, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, Vermont, Washington, and Wisconsin) and Washington, D.C. to determine the current safety conditions of our public playgrounds.

The 2002 investigation focused on the hazards that cause the most serious playground injuries and found the following:

- **SURFACING: 75% of the 1,037 playgrounds surveyed lacked adequate protective surfacing,** an improvement over the 80% found in 2000 without adequate protective surfacing. We are particularly encouraged by the decrease in the number of playgrounds with hard surfaces, the least forgiving with respect to injury. Protective surfacing is the **most critical safety factor** on playgrounds because approximately 80% of all injuries are caused by falls.

• **SLIDES AND CLIMBERS:**

• **28% of the playgrounds surveyed did not have an adequate fall zone under and around slides and climbing equipment**. Other equipment and obstacles in the fall zone pose hazards to children if they fall.

• **58% of playgrounds surveyed had climbers or slides where the height of the play equipment exceeded six feet,** which is higher than necessary for play value and only serves to increase the risk of injury.

• **SWINGS:**

• **30% of playgrounds surveyed with swings had inadequate fall zones surrounding the swing bay.**

• **55% of playgrounds surveyed with swings had swing bays with pivot points exceeding eight feet in height.**

• **49% of playgrounds surveyed with swings violated one or more recommended guideline for safety, such as swings made with heavy, rigid material, inadequate spacing between swings and supports, and placement of tot swings with traditional swings.**

• **ENTRAPMENT: 34% of playgrounds surveyed had improperly sized openings in the play equipment, posing a head entrapment hazard that could lead to strangulation.**

• **ENTANGLEMENT: 34% of playgrounds surveyed had small gaps, open S-hooks and other protrusions that pose clothing entanglement hazards.**

• **HAZARDOUS EQUIPMENT: 29% of playgrounds surveyed had unacceptable dangerous equipment, such as chain or cable walks, animal swings, individual climbing ropes or swinging exercise rings.**

• **PLAYGROUND MATERIAL:**

• **46% of all playgrounds surveyed had peeling, chipping or cracking paint on equipment surfaces.**

• **14% of all playgrounds surveyed were made of wood that *may be* pressure treated. Some pressure treated wood contains chromium copper arsenate.**

Overall, this year's survey shows improvements, in particular, a continued decline in the number of playgrounds with hard surfaces under and around **all** play equipment. In 1992, fully 31% of playgrounds surveyed had cement, packed dirt, asphalt or other hard surfaces; this percentage declined to 13% in 1994; 9% in 1996; 8% in 1998; 5% in 2000; and **4.5% this year**. However, as in previous surveys, many playgrounds have mixed surfacing, with loose-fill, absorbent materials like hardwood chips under some equipment and unsafe hard surfaces like soil and grass under other equipment.

Surveyors continue to note the gradual replacement of old, unsafe playgrounds with new, modern playgrounds. Yet changes move slowly and, with budget constraints, many local governments may not prioritize playground safety unless parents and advocates make it a key issue. Local authorities **should** make public playgrounds safer. To improve playground safety, CFA and PIRG offer the following recommendations:

- States and local governments should adopt CFA's "Model Law on Public Play Equipment and Areas."

- Parents, school administrators, childcare providers and parks personnel should evaluate their local playgrounds and work to make each playground safer.

PLAYGROUNDS CAN BE PERILOUS

In the fall of 2002, in Boynton Beach, Florida, a five year-old girl was swinging on the gymnast bars at a local playground when she fell six feet onto a bare dirt surface without protective surfacing. She received a fracture to her left arm.[1]

In July of 2001, a seven year-old girl in Bainbridge, Washington sustained a severe jaw fracture after falling onto an inadequate playground surface.[2]

On May 14, 2001 in Jamestown, North Carolina, a seven year-old girl stopped breathing after she fell from the top of a slide at a playground. She hit her head on the concrete surface below the playground.[3]

On November 22, 2001 in Fort Worth, Texas, a twelve year-old girl died after she slipped and fell 11 feet onto the ground from monkey bars in a public playground.[4]

On October 28, 2001 in Lompoc, California, a four-year old boy was found unconscious, dangling over the side of a slide at a playground with his karate belt across his neck and under one arm. He died due to asphyxia by hanging.[5]

On September 13, 2001 in Highland Park, Illinois, a three year-old boy suffered from a strangulation injury when his jacket's zipper became caught in an almost 1/2 inch opening in the standing platform of playground equipment.[6]

A nine year-old boy in New York state fractured his arm and sustained permanent injury in July of 2000 after falling from a cross bar on a school playground. The areas under the cross bar had little surface covering.[7]

On April 10, 2000 in Phoenix, Arizona, a four year-old boy was playing on playground equipment when his head got stuck in a 4 ½ by 4 ½ inch gap on a metal climber. The boy was hanging by his neck while a school monitor held up his body so that he would not die of strangulation.[8]

In 1997, a seven year-old boy from Aliso Viejo, California fell from monkey bars as he was playing in his school's playground. He broke his arm and suffered other complications, which have left him without the use of his left arm.[9]

Children love to play — especially outdoors. The outdoor environment provides unique opportunities for play and, therefore, for learning. But children can only benefit from playing outdoors if it is safe. Outdoor play equipment, in particular, poses hazards to children when it is not carefully designed or maintained.

More and more children are injured on public playgrounds each year. The Consumer Product Safety Commission (CPSC) estimates that almost 190,000[10] children were injured seriously enough on public playground equipment to require emergency room treatment in 2001. Tragically, an average of between 15 and 20 children die each year

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playing on playgrounds. Many of these deaths and injuries can be prevented if playgrounds are designed with greater attention to safety.

Unfortunately, the federal government has not done enough to improve playground safety. There are no mandatory national standards for the design and construction of outdoor play equipment. Although the CPSC published a "Handbook for Public Playground Safety" (November 1991, and revised in 1994 and 1997), this handbook is only a set of guidelines — not a standard. Compliance with the CPSC recommendations is not mandatory.

Injuries and deaths related to public playground equipment — injuries and deaths that could be prevented — continue to occur at alarming rates. For children under the age of six, the injury rate in our country has doubled since 1980. The United States lags behind other industrialized nations in providing safe playground equipment. Many European countries and Canada have mandatory standards. Our children deserve the same level of protection.

In 1998, Consumer Federation of America (CFA) released the third edition of its "Report and Model Law on Public Play Equipment and Areas."[11] The goal of CFA's report was to educate those responsible for and those who care about playgrounds — including parents, school administrators, child care providers, parks personnel, and designers so that they could make informed and safe choices about play equipment and the layout of play areas.

CFA's report details the hazards on playgrounds and presents safety and design criteria for safer playgrounds in the form of a model law. The CFA model law (second addition) represents what was at the time of publication (1998), the state of the art in safety and design for public play equipment and areas. While no play area or piece of equipment can be made completely safe, careful design can minimize injuries and save children's lives.

"Playing It Safe: The Sixth Nationwide Safety Survey of Public Playgrounds" follows up on previous State PIRG/CFA playground safety surveys and the CFA model law by investigating the current safety conditions of public playgrounds across the country.

DEATHS AND INJURIES ON PUBLIC PLAYGROUNDS

Public playground equipment continues to be a major cause of injury for children. According to a *Journal of Ambulatory Pediatrics* study of emergency room visits in the United States from 1992 to 1997, injuries due to falls from playground equipment resulted in a higher proportion of severe injuries than either bicycle or motor vehicles.[12] One child is injured every 2.5 minutes on playground equipment in the United States.[13]

DEATH

Twenty one percent (21%) of playground-related deaths involve falls. Of all deaths caused by falls, about 75% involve head injuries.[14]

Other causes of death involve hanging, tip over/collapse of equipment, entrapment, and impact with moving equipment. Strangulation accounts for just over one-half of all fatalities related to playground equipment. Most strangulation incidents involve entanglement. The typical entanglement scenario occurs because something a child is wearing or playing with gets caught on equipment — very often on slides or swings. Clothing, scarves, mittens, jacket strings, and jacket hoods have become entangled in narrow gaps between equipment components, on vertical posts, and on open connecting links such as "S" hooks, causing death by strangulation. Ropes, jump ropes, and leashes, either attached to equipment or being worn around a child's neck, also have been implicated in strangulation deaths. Similarly, free hanging ropes are also a cause of playground fatalities.

Head entrapment in playground equipment also causes strangulation deaths. In these scenarios, a child's head or neck becomes entrapped between pieces of equipment, such as two rungs on a ladder.

The fatalities resulting from impact with moving equipment almost always involve head injuries resulting from swing impact.

INJURY

Falls — usually to the ground surface below equipment — account for approximately 80% of all playground-related injuries.[15] Sixty eight percent (68%) of the injuries involved falls to the surface below equipment while 10% involved falls to other parts of the same equipment.[16] The most frequently reported cause of falls (40%) was the child losing his or her grip on climbing bars or swing chains. Other frequently reported causes of falls included the victim's feet slipping or tripping on slides (16%) or the child losing his or her balance on slides (10%).[17]

Other causes of injury involve impact with moving equipment or running into stationary equipment. In the past, injuries also have involved sharp edges, protrusions, pinch points, hot surfaces, and debris in the play area.

Victim Age

Children under the age of five suffer approximately 31% of all public playground equipment-related injuries; children younger than ten are involved in 79% of all playground deaths. Females were injured slightly more (55%) than males (45%). Almost all playground injuries involved children younger than 15 years.[18]

Although falls are the most common mode of injury for both younger and older children, younger children are more likely to sustain injuries to the head and face. Young children falling from play equipment often do not have the motor coordination or cognitive skills necessary to protect their heads by breaking a fall with their arms. In addition, young children are at greater risk for head and facial injuries caused by impact with moving equipment such as swings.

Because older children's cognitive and perceptual skills are more refined, they better anticipate and avoid moving swings. They also are better able to react to a fall, typically using their arms to break their landing. Consequently, older children reduce the risk of head injury, but they simultaneously increase the risk of upper limb fracture.

Patterns of Injury

Superficial facial injuries (i.e., lacerations and contusions) and serious head injuries (i.e., skull fractures, concussions, and internal head injuries) are the two predominant patterns of injury for young children on slides, swings, and climbers. For preschool age children, head and face injuries were most common, accounting for almost half (49%) of the injuries.[19] For older children, head and face injuries accounted for 28% of the total, and arm and hand injuries were most common, with almost half of the injuries (49%).[20]

Climbers are the most frequent cause of injury for children, both preschool and school age. Climber incidents account for 40% of all playground injuries to pre-school age children and 56% to school-age children.[21] The second most common piece of equipment involved in injuries to pre-school children are slides (33%); the second most common piece of equipment involved in injuries to school age children are swings (24%).[22]

THE 2002 NATIONWIDE SURVEY OF PUBLIC PLAYGROUNDS

The Nation's Playgrounds Pose Hidden Hazards

From March-May 2002, the PIRGs and other CFA member organizations investigated 1,037 playgrounds in 36 states (Alabama, Arizona, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Virginia, Vermont, Washington, and Wisconsin) and Washington, D.C. to determine the current safety conditions of our public playgrounds.

Because we did not necessarily survey all of the same playgrounds as in 2000, our data are not strictly statistically comparable to our 2000 data but do highlight some general trends about playgrounds across the country.

The investigation focused on the hazards that cause the most serious playground injuries: falls, impact with moving swings, head entrapment, and entanglement.

This year's survey found improvements from the results of our 1992, 1994, 1996, 1998, and 2000 surveys, although widespread hazards still exist at playgrounds around the country.

FALLS

Many design strategies can minimize the injuries and deaths caused by falls. Three strategies are: (1) maintaining adequate protective surfacing, (2) removing other equipment and obstacles from areas where a child might fall (the "fall zones"), and (3) limiting the height of play equipment.

Protective surfacing under and around all play equipment is the ***most critical safety factor*** on playgrounds, yet the investigation found that a majority of the playgrounds surveyed lack adequate protective surfacing. **In our 2002 survey, we found that 75% of the 1,037 playgrounds surveyed lack adequate protective surfacing.**

Table 1. Percentage of Playgrounds Surveyed with Adequate Surfacing (1994-2002)

	1994	1996	1998	2000	2002
Loose Fill of depth greater than 9 inches (wood chips, mulch, sand, etc.)	3%	10%	6%	10%	11%
Rubber or Synthetic Surfacing	5%	5%	7%	10%	14%
Total Adequate	**8%**	**15%**	**13%**	**20%**	**25.0%**

Note: Numbers are rounded.

Table 2. Percentage of Playgrounds Surveyed with Inadequate Surfacing (1994-2002)

	1994	1996	1998	2000	2002
Loose Fill of inadequate depth (less than 9 inches)	60%	61%	58%	52%	62%
Hard Surfaces (cement, asphalt, grass, packed soil, etc)	13%	9%	8%	5%	5%
Mixed Hard and Loose Fill Surfaces	19%	15%	22%	23%	8%
Total Inadequate	**92%**	**85%**	**87%**	**80%**	**75.0%**

Note: Numbers are rounded.

Falls from play equipment can cause life-threatening head impact injuries. The surfacing on which a falling child lands is a major determinant of the injury-causing potential of the fall. Protective surfacing cannot prevent all injuries due to falls, but it can help reduce both the frequency and severity of injuries. Falls onto a resilient surface are less likely to result in a life-threatening injury. The greater the resiliency of the surface, the greater the safety.

Hard Surfaces Are Unacceptable

Protective surfacing materials should cushion a fall. Hard or paved surfaces such as concrete, asphalt, and earth surfaces including grass, soil and hard packed dirt ***are not acceptable*** because they do not provide adequate protection against falls. Falls onto concrete or asphalt from as low as two inches can cause life threatening head injuries. Our 2002 survey found:

- **4.5% percent of playgrounds surveyed had hard surfaces, representing a slight decrease from the 5% we reported in 2000.**

- **An additional 8% of playgrounds surveyed had a mixture of hard and loose fill surfaces, representing a steep decline from the 23% we reported in 2000.**

On playgrounds with mixed hard and loose-fill surfaces, surveyors often found worn grass or other hard surfaces under one piece of older equipment, for example, but adequate loose fill surfacing under a newer piece of equipment. In these cases, the playground caretakers may have chosen to install adequate surfacing under new equipment as it is added to the playground. In other cases, the caretaker may have chosen to add adequate depths of loose-fill surfacing under certain pieces of equipment, regardless of the age, rather than spread it over the entire playground at an inadequate depth.

Maintained Loose Fill Materials and Synthetic Surfaces Are Acceptable

Acceptable protective surfacing materials include certain loose-fill materials — such as hardwood chips — when properly maintained at depths of at least 9 to 12 inches.

- **While 73% of all playgrounds surveyed had a loose fill surface, only 11% of the total (15% of the loose fill playgrounds) maintained the surface at an adequate depth (greater than or equal to 9 inches).**

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• **Of the 85% of the loose-fill playgrounds surveyed with inadequate depths of loose-fill surfacing, 22% had loose-fill depths of 6-9 inches.** These playgrounds are close to providing adequate surfacing. However, compaction, decomposition, and displacement, in addition to inadequate depths at installation, can all contribute to depths below nine inches.

Certain unitary synthetic surfaces — such as premolded rubber tiles —also meet impact requirements.

• **More than 14% of the playgrounds surveyed had synthetic surfacing under and around all of the equipment, up from 10% in 2000.**

FALL ZONES

A fall zone is the area under and around a piece of play equipment where a child might fall. To reduce injuries, protective surfacing should be installed throughout the fall zone, and the fall zone should be free of other equipment or obstacles onto which a child might fall. In addition, the fall zone provides adequate space for children to use various play equipment without interfering with the play of other children on different equipment.

Climbing Equipment and Slides[23]

Approximately 53% of all injuries associated with public playground equipment involve climbers. Almost all climber-related injuries are due to falls.

Of all injuries on climbers, 87% are sustained by children between two and nine years old. In fact, climbers are the type of equipment most frequently implicated in playground injuries for all children younger than 13 years old; for 13-14 year olds, climbers account for 48% of injuries and swings for 52%. To minimize injuries, stationary climbing equipment should have a fall zone extending a minimum of six feet in all directions from the perimeter of the equipment.

Slides account for 17% of all public playground equipment-related injuries. Of all injuries sustained on slides, 62% are associated with falls to the surface below the equipment, and another one-fifth involve falls onto other parts of the equipment. Falls from the platform, from the top of the slide, and from the top portion of the slide chute are most common. Falls also often occur as children climb ladders that access slide structures.

For slides, the fall zone behind the access ladder and to the sides of a slide should extend a minimum of six feet from the perimeter of the equipment. The fall zone in front of the exit of a slide should extend a minimum distance of six feet from the end of the slide chute.

• **For slides and climbers, 28% of the equipment surveyed in 2002 did not have an adequate fall zone, compared to 31% in 2000.**

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Swings
Swings are involved in 19% of all injuries related to public playground equipment.[24] Falls account for almost three quarters of swing injuries, the vast majority being falls to the surface.

The fall zone for swings should extend a minimum of six feet from the perimeter of the support structure on each side as well as a minimum distance of twice the height of the pivot point in front of and behind the swing seats.

> **• In 2002, 30% of the playgrounds surveyed with a swing bay did not have an adequate fall zone for the swings, as compared to 39% in 2000.**

EQUIPMENT HEIGHT

While increasing the height of the equipment does not necessarily increase challenge or play value, it always increases hazard. Limiting the height of play equipment is an essential means of reducing the frequency and severity of injury.

Climbing Equipment
The highest climbing member, such as a rung or platform, of climbing equipment should not be higher than six feet for school-age children or four feet for preschool-age children.

> **• 52% of the playgrounds surveyed in 2002 contained climbing equipment more than six feet high, a slight increase from 2000, when 48% of the climbing equipment surveyed exceeded six feet.**

Slides
The platform of a slide should not be higher than six feet for school-age children or four feet for preschool-age children.

> **• 35% of the playgrounds surveyed in 2002 contained a slide measuring more than six feet high, compared to 36% in 2000.**

SWINGS

Impact with moving swings causes 69% of all swing injuries.[25] Children between the age of five and nine are those most often injured during moving impact incidents. Young children often do not pay attention to things outside their direct view, such as a moving swing. Further, young children commonly center on a single idea or event. As a result, injuries often occur because young children inadvertently walk into the path of a moving swing while concentrating on other activities. The typical scenario involves a young child walking in front of or behind a moving swing and getting hit, either by the seat itself or by a child in the seat. Therefore, injuries to the head and face are common.

A 24-inch minimum clearance between adjacent swings accommodates the shoulder breadth of a 95th percentile 12-year-old (16 inches) with some tolerance on each side; at the same time this distance is not so large as to encourage children to run between swings. The minimum clearance (30 inches) between a swing and an adjacent structural component is greater to provide extra protection against injuries caused by impact with a rigid structure.

Limiting the swing structures to two seats per bay helps reduce the likelihood of children getting hit by a moving swing. When there are more than two swings per bay, children swinging on a middle swing(s) are at increased risk of a collision from one or both sides. In addition, children do not always swing straight and their play patterns often cause the swings to move out of the usual to-fro axis (e.g. twisting the swing and then letting it unwind or jumping off without stopping the swing's motion).

Overall, in 2002, 49% of playgrounds surveyed with swings[a] posed one or more of the following hazards that could increase the risk of a child being hit by a moving swing, compared to 27% in 2000. Although *each* of the following hazards occur on less than 20% of the playgrounds surveyed with swings, almost half of all playgrounds surveyed with swings—or 39% of *all* playgrounds surveyed—pose at least one of the hazards.

Spacing Between Swings
Swings should be 24 or more inches apart.

> **• 14% of playgrounds surveyed with swings had at least one swing bay where swings were too close together, compared to 17% in 2000.**

Swings should be at least 30 inches from swing supports.

> **• 17% of playgrounds surveyed had swings less than 30 inches from the support structure, a decline from 20% in 2000.**

Swings should be spaced no more than two swings per bay.

> **• 17% of playgrounds surveyed had one or more swing bay with more than two swings per bay, a decline from 24% in 2000.**

Tot/Infant Swing Spacing
Tot/infant swings should not be mixed with swings intended for older children.

> **• 12% of playgrounds surveyed mixed tot/infant and other swings, a slight decline from 13% in 2000.**

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[a] 808 of the playgrounds surveyed had swings.

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Swing Seats
All swing seats should be made of lightweight, impact-absorbing materials, such as rubber, to reduce the severity of injuries if impact incidents do occur.

> **• 10% of playgrounds surveyed with swings contained swing seats made of wood, metal or other rigid material. This is less than 2000 (13%) and a significant decrease from 1994, when 26% of swings were made of rigid material.**

Attached to Other Equipment
Swings attached to other equipment, such as a climber, increase the risk of striking a child playing near the swing or distracted by other activity.

> **• 6% of playgrounds surveyed with swings contained swings attached to other equipment, such as an independent climber.**

HEAD ENTRAPMENT HAZARDS

Even playgrounds that look safe to parents — those that have protective surfacing, adequate space around equipment, and swings that are designed to minimize impact injuries — may present hidden hazards, like head entrapment. For example, rungs spaced five inches apart on a piece of climbing equipment may not readily appear dangerous but do pose a strangulation hazard. Entrapment may occur when a child enters an opening, either head first or feet first, but cannot withdraw his or her head because the opening is too small.

Head and neck entrapment presents a very serious risk of death by strangulation for young children and, therefore, warrants extra precaution. Any opening — except those where the ground serves as its lower boundary — with an interior dimension between 3.5 inches and 9 inches may cause head entrapment.

> **• 34% of playgrounds surveyed contain at least one head entrapment hazard, remaining at the same level as in 2000 but down from previous years (42% in 1998, 46% of playgrounds in 1996, and 55% of playgrounds in 1994.)**

ENTANGLEMENT HAZARDS

Protrusions and projections on play equipment, gaps, holes or other openings in the play equipment can cause serious injury or death by strangulation if such hazards can entangle children's clothing. Many protrusions, projections and gaps can be eliminated through the design of the equipment or by recessing or countersinking potential hazards, such as connecting hardware. Special attention to protrusions, projections, gaps, openings and holes, which may present entanglement hazards at the top of slides, is warranted. Jackets or clothing with hoods and/or drawstrings have been implicated in such entanglement strangulation incidents.

• **In 34% of playgrounds surveyed, open S-hooks, gaps, protrusions and other features that may act as hooks or catch points posed clothing entanglement hazards, a decline from 38% in 2000.**

HAZARDOUS EQUIPMENT

Certain types of equipment should not be included in public play areas. **In 2002, the State PIRGs and CFA found that 29% of all playgrounds surveyed contained one or more of the following hazardous pieces of equipment, down from 38% in 2000.**

Animal swings, multiple occupancy swings, swinging exercise rings, and trapeze bars are constructed of heavy, hard-hitting, rigid materials that can cause serious head impact injuries. The 2002 survey found:

• **2% of all playgrounds surveyed have animal swings, remaining at the same level as in 2000 but significantly down from 19% of the playgrounds surveyed in 1992, 11% in 1994, and 4% in 1998.**

• **2% of all playgrounds surveyed have multiple occupancy swings or gliders.**

• **16% of all playgrounds surveyed have swinging exercise rings or trapeze bars, staying at the same level as in 2000. This is down from 23% in 1998.**

Rope swings present children with a free hanging rope that poses a strangulation hazard.

• **3% of all playgrounds surveyed have a climbing rope or rope swing.**

Chain or cable walks present tripping hazards. Further, if not well-maintained, they provide children with a chain or cable attached only on one end, which presents the risk of strangulation.

• **15% of all playgrounds surveyed have a chain or cable walk, compared to 17% in 2000.**

CHIPPING OR PEELING PAINT

Forty-six (46%) percent of all playgrounds surveyed had peeling, chipping or cracking paint on equipment surfaces, compared to 47% in 2000.

Testing by the CPSC and other agencies has determined that some playground equipment is painted with lead paint. When the lead paint deteriorates, the resulting chips and dust may be ingested by young children who regularly touch the equipment while playing and then transfer the paint chips or dust from their hands to their mouths. The amount of paint that may be ingested can contribute to a hazardous and unnecessarily high lead exposure, which is linked to diminished IQ and other developmental difficulties in children.

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CFA and PIRG did not conduct any lead testing, nor take paint samples. However, the results of recent CPSC tests, coupled with the high percentage of playgrounds with peeling paint, suggest that local officials should consider inspecting their playgrounds and conducting additional testing.

PRESSURE TREATED WOOD

Almost 14% of the playgrounds surveyed contained wood that *may be* pressure-treated. Some pressure treated wood may contain chromated copper arsenate.

Wood playground equipment may be made of pressure treated wood. Pressure treated wood may contain toxins used to preserve the wood and prevent bugs. Until one year ago, 99% of all wooden playground equipment that was not made of red wood or cedar was pressure treated. Pressure treated wood is wood that has been treated with chemical preservatives forced deep into the cellular structure of the wood. This process enables the preserved wood to maintain a chemical barrier against termites and decay for long periods of time.[26] The most common wood preservative and pesticide used for this purpose is chromated copper arsenate (CCA).

Arsenic is classified as a known human carcinogen by the U.S. EPA and the World Health Organization. Children playing on playground equipment made of pressure treated wood containing CCA may be exposed to high levels of CCA by placing their hands in their mouths after playing on the equipment. Two studies[27] have concluded that increased exposure to arsenic results from children's contact with play structures.[28] Symptoms of arsenic poisoning include vomiting, diarrhea, muscle cramps, facial swelling, and shock.[29]

CFA and PIRG did not test playground equipment for chromated copper arsenate or any other toxins. However, if playground equipment is made of wood other than red wood or cedar, which are not pressure-treated, local authorities should collect and test wood samples to determine if CCA is present and if so at what levels.

PLAYGROUND REGULATIONS AND COMMUNITY ADVOCACY

The absence of a national law governing playground safety creates a dire need for strong advocacy at the state and local level. State and local laws are now being considered across the country in many forms and by many authorities — but all share the same goal of mandating safety requirements for playground design, installation, and maintenance.

At the local level, public school districts and recreation departments often incorporate playground safety specifications in their purchasing and maintenance guidelines. In many cases, requirements are general, stating that any new equipment must comply with CPSC guidelines and American Society for Testing & Materials (ASTM) voluntary standards for public play equipment. Sometimes, additional language is included to address specific hazards. Listing any types of equipment that a school district or recreation department does not allow and specifying a maximum height for different types of equipment are common and important parts of local guidelines (as included in the CFA model law). Local regulations or guidelines should include as many details as possible. Parents and other advocates have strong voices in these settings and can promote the development of and adherence to local playground safety requirements.

LOCAL ACTIVITY

Advocacy efforts targeted to **local** governing bodies have also proven successful.[30]

a. Pittsburgh, Pennsylvania

The City Council in Pittsburgh enacted one of the first city ordinances mandating a comprehensive playground safety program. Today, Pittsburgh's efforts provide a model for other cities looking to improve their playgrounds. Local parents, together with representatives of CFA, approached Pittsburgh City Councilman Dan Cohen to discuss playground safety and the need for local regulations. In 1993, the City Council passed an ordinance that outlined a plan to train city personnel in playground safety, to audit all city playgrounds, and to renovate all city playgrounds. The training and audits were completed over the next several years. After continued advocacy efforts, funds have been allocated to complete the necessary renovations to existing playgrounds. Purchasing new playground equipment and surfacing was also addressed: all new playgrounds in Pittsburgh must comply with CPSC and ASTM specifications. The CFA model law provided a basis for the Pittsburgh ordinance.

b. Chicago, Illinois

A joint effort of the City of Chicago, the Chicago Public Schools, and the Chicago Park District is funding a four-year program to improve parkland and playgrounds on public

school grounds. This development initiative will create 100 new school parks. In the first two years of the program, approximately $12.5 million dollars each year was committed to Chicago's School Park Program. Program sponsors are bringing together principals, school councils, parents, students, and neighborhood residents to help with the design and development of the new playgrounds. The Chicago Public Schools will be primarily responsible for on-going maintenance, with support as needed from the Chicago Park District.

c. Boston, Massachusetts

The Boston Schoolyard Initiative is a collaborative effort of city officials, school administrators, families, community leaders, and local foundations with the goal of reclaiming Boston's schoolyards. As described by Boston's Mayor, Thomas Menino, "We are going to reclaim schoolyards that have been neglected and turn them over to the children to use for fun and learning." Since 1996, nearly 50 new playgrounds have been funded through this five-year partnership. The City of Boston also allocated $6 million from its capital budget for these new playgrounds.

For each playground project, landscape architects work with the students, parents, teachers, principals, school maintenance personnel, local citizens, local businesses, and community organizations. This participatory process is creating new playgrounds as well as new outdoor learning environments complete with other areas and activities.

d. Edgewood, Pennsylvania

In response to grassroots advocacy, public funding was allocated from the borough council of Edgewood, Pennsylvania and the state treasury for improving the safety of playgrounds in the area. A local foundation, the civic association, and the local fire department contributed to the project. All of the old, dangerous equipment was removed and replaced with new equipment and adequate protective surfacing.

e. Anchorage, Alaska

Mayor Mystrom, who became Anchorage's mayor in 1995, made upgrading or removing hazardous playground equipment a top priority. Four city employees were trained as Certified Playground Inspectors and then used the CPSC guidelines to evaluate 23 city playgrounds. The inspection program classified hazardous equipment as "life-threatening," "possible injury," or "potentially unsafe." Equipment deemed "life-threatening" was immediately removed from playgrounds, even though new equipment could not be installed immediately. Mayor Mystrom decided that no play equipment was better than such dangerous equipment. Alaska PIRG was instrumental in this effort.

f. Berkeley, California

In 1995, Berkeley Partners for Parks (BPFP) joined with the City of Berkeley and the Parks and Recreation Commission to survey 49 playgrounds and found that 20 of them did not meet CPSC safety guidelines. To support renovation efforts, BPFP established "Adopt-a-Park Groups" comprised of neighborhood volunteers for 28 different sites who help in many ways as the city works to improve playgrounds, community gardens, and

public landscaping. The City of Berkeley developed a Five Year Strategic Plan to fund playground renovations at the rate of $150,000. BPFP committed to match the city's funding as part of their partnership agreement.

g. New York City and Newark, New Jersey

The Trust for Public Land has been targeting New York's underserved neighborhoods to build new playground through its City Spaces Program since 1996. Together with the Supportive Children's Advocacy Network, this program involves community residents and forms partnerships between community groups and the city's Department of Parks and Recreation. Meeting the particular needs of each different community is a focal point of the design process. City Spaces turned many old paved sites like parking lots and bus depots into safe playgrounds and parks.

h. National Park Service

The National Park Service owns and operates playgrounds across the country. Each year, more of its playgrounds are being renovated through the Urban Park and Recreation Recovery Program (UPARR), which provides recreation grants for economically distressed urban cities. Cities must apply for these funds through the federal process. Three cities received grants in FY 2000 for projects that include installation of new playground equipment and resilient surfacing, including Bridgeport, Connecticut; Clarksville, Tennessee; and Richmond, Virginia.

i. Baltimore, Maryland

Mayor O'Malley recognized the importance of improving Baltimore's playgrounds. On a trip to Pittsburgh, he was impressed with that city's initiative and vowed to make playgrounds safer in Baltimore. To advise the city and make recommendations on how to proceed with playground improvement, Mayor O'Malley established a Baltimore City Playground Task Force, headed by an official in the Recreation and Parks Department. This task force includes city parks personnel, school officials, representatives from community organizations such as the Neighborhood Design Center, parents, injury prevention experts, and child development experts.

The Neighborhood Design Center (NDC) worked to make school and park playgrounds safer through launching a grassroots initiative, Playing Safe. NDC plans to replicate some of the successful strategies used in Chicago, Boston, and Pittsburgh to raise awareness, generate funds, and mandate compliance with playground safety regulations throughout Baltimore.

The NDC developed a survey tool and trained more than 100 community residents, including youth ambassadors, from more than 40 Baltimore neighborhoods. These trained volunteers then surveyed dozens of park playgrounds and 120 elementary school sites, only 50 of which had playground equipment.

NDC selected 10 proposals to receive funding as model playground sites and is now working to implement these projects. Continued education campaigns and technical assistance are cornerstones of Playing Safe.

STATE ACTIVITY

At the **state** level, lawmakers — often urged by consumers — have passed legislation or regulations addressing playground safety in 15 states with a wide range of requirements. The strongest regulations require compliance with the CPSC guidelines, and sometimes also the American Society for Testing and Materials (ASTM) standards, for all public playgrounds in the state. The weakest regulations, narrowly focusing only on child care settings, requiring compliance with CPSC guidelines for protective surfacing only, merely suggesting consultation with CPSC guidelines, or providing playground safety in a list of potential courses for day care providers.

a. Arkansas

The Arkansas Department of Education Rules and Regulations Governing Arkansas Better Chance Program Regulations (Code Ark. R. 005 24 001) sets the general guidelines for the operation of early childhood programs funded under the Arkansas Better Chance Program. In section 13.13, the regulation outlines that outdoor play areas should be developmentally appropriate and meet the Consumer Product Safety Commission standards for outdoor play areas. The regulations setting forth licensing requirements for child care facilities (Ark Code Ann. § 20-78-201-20 and the Child Care Facility Licensing Act, Act 434 of 1969 as amended) also require that all equipment installed on or after September 1, 1997, which is designed to be permanently anchored, must meet and be installed according to CPSC standards which are in effect at the time (Section 902(2) and 802(1) respectively).

b. California

The California Health and Safety Code (115725) was the first state legislation to mandate development of comprehensive statewide regulations for playground safety, requiring adoption of such regulations by January 1, 1992. The statewide regulations are required to be at least as protective as the CPSC guidelines. They also must include special provisions for childcare settings and address the needs of the developmentally disabled. After the effective date of these regulations, no state funds may be used for the planning, development or redevelopment of a playground unless the playground conforms to the regulations. In addition, all public agencies must specifically upgrade their playgrounds by replacement or improvement as necessary to satisfy the regulations (115730).

Until recently, however, no regulations had been enacted. Title 22 "Safety Regulations for Playgrounds" of the California Code of Regulation was filed on December 12, 1999 and went into effect on January 1, 2000. These statewide regulations provide detailed specifications for the design, installation and maintenance of public playgrounds, referencing compliance with CPSC and ASTM guidelines as mandatory. In addition, operators of public playgrounds are required to have an initial inspection of their playgrounds by a Certified Playground Safety Inspector by October 1, 2000; then upgrades must be made to satisfy the regulations as required by the previous noted code provisions.

c. Connecticut

Connecticut's Department of Consumer Protection (Title 21a, Chapter 416, Section 21a-12a) required the development of a training and educational program on playground safety issues and the adoption of standards for playground equipment. The state subsequently adopted CPSC guidelines—as voluntary rather than mandatory—with an effective date of January 1, 1997 and made the annual presentation of a training and education program merely permissive rather than required.

d. Florida

Florida's Child Care Standards (F.A.C. 65C-22.003) include playground safety in the list of potential courses required to be taken by childcare providers.

e. Illinois

Illinois' licensing standards for day care centers (89 Ill. Adm. Code 407.390) set forth requirements for playground equipment at day care centers. The standards require that protective surfacing be in compliance with CPSC guidelines. Other components of the standards do not specifically mandate compliance with CPSC guidelines but outline similar requirements. For example, the Illinois law requires that there be a six-foot fall zone around all equipment except for swings. The fall zone for swings must extend both forward and backward a distance of at least two times the height measured from the supporting bar. In addition, swing seats are to be made of rubber or impact-absorbing material and design. Standards are included to prevent entrapment hazards such that no openings between 3 ½ and 9 inches shall exist. In addition, daily inspection of the playground is required by a day care director or designee before children go out to play to ensure that no hazards are present.

f. Michigan

Laws in Michigan require all new playground equipment to satisfy both CPSC and ASTM specifications, effective September 1, 1997, while also imposing state civil penalties for those who violate these specifications for manufacturing or assembling playground equipment.

g. New Jersey

New Jersey enacted a playground safety law on March 23, 1999 to require that the Department of Community Affairs and Department of Education promulgate rules and regulations for the design, installation, inspection, and maintenance of playgrounds. This law also mandates that those rules and regulations be those contained within the CPSC guidelines. Further, it requires that special provisions be included to address playgrounds appropriate for children in childcare settings. Government entities and private entities must upgrade their playgrounds to satisfy the rules and regulations for surfacing within five years and for all other elements within eight years. Non-profit entities must upgrade their playgrounds to satisfy the rules and regulations for surfacing within five years and for all other elements within fifteen years. All playgrounds built more than six months after the effective date of the rules and regulations must conform to those rules and regulation. New Jersey PIRG was instrumental in achieving this statewide mandate.

h. North Carolina

North Carolina addresses playground safety for childcare facilities, requiring all new equipment and surfacing to conform to CPSC guidelines beginning on January 1, 1996. Playground equipment and surfacing installed in childcare facilities prior to January 1, 1996 must conform to CPSC guidelines by January 1, 1999. These state requirements also prohibit the use of gravel for surfacing if the area will serve children less than three years of age.

i. Oklahoma

The Oklahoma Administrative Code includes standards for playgrounds in child care settings as part of its licensing standards. (O.A.C. 340:110-3-22). The standards make no mention of CPSC guidelines; rather, the standards set out, for the most part, weaker requirements than CPSC and ASTM. For example, the regulations maintain that grass is an acceptable surface under equipment less than four feet high (340: 110-3-22(b) (2) (B)), and that six inches of loose fill material is sufficient for adequate protective surfacing (340: 110-3-22(b) (4)). The regulations set out standards for fall zones of at least six feet for all equipment except for swings, which require a fall zone a distance twice the length of the swing's chain. The regulations also include entrapment and entanglement hazard prevention, as well as swing seat composition requirements.

j. Oregon

Oregon's administrative rules certifying the physical setting of child care settings (Or. Admin. R. 414-300-0150) require that the protective surfacing in child care center playgrounds must comply with the standards of the U.S. Consumer Product Safety Commission.

k. Rhode Island

Following a statewide audit of municipal playgrounds by the Department of Health, personnel in local parks and recreation officials received education and training to improve playgrounds. Space bond money was allocated to remove old, dangerous equipment and installing new, safer playgrounds.

In addition, in December 1999, Rhode Island's Rules and Regulations for School Health Programs (R16-21-SCHO, Section 35) were amended to require that all public school playground equipment and surfaces meet current CPSC safety guidelines by July 1, 2002. To ensure that school officials understand the new rules and regulations and how to implement them, the Department of Education provided a statewide workshop.

l. Tennessee

Tennessee's Licensure Rules for Child Care Centers Serving Pre-School Children (Tenn. Comp. R. & Regs. 1240-4-3-.08) include that the CPSC's "Handbook on Public Playground Safety" or similar authority be used for guidance on playground construction and maintenance. While consultation with the guidelines is suggested, compliance with the guidelines is not required. In fact, the Tennessee rules explicitly state that fall zones should be between four and six feet, which is not in compliance with CPSC guidelines, which require a minimum of six feet. However, the Tennessee rules for playground

surfacing (in appendix E) require that surfacing type and depth be in compliance with CPSC's guidelines.

m. Texas

The Texas Health & Safety Code (756.061) requires substantial compliance with the CPSC guidelines for the purchase and installation of new playground equipment and surfacing beginning on September 1, 1997 if public funds are used.

n. Utah

The administrative rules setting forth standards for child care center licensing (Utah Admin. R. 430-60) require that the protective surfacing in childcare center playgrounds must comply with U.S. Consumer Product Safety Commission and ASTM guidelines. The rules also require a fall zone of six feet surrounding all playground equipment.

o. Virginia

The Minimum Standards for Licensed Child Day Centers for Virginia (22 VAC 15-30-310) require that a center develop written playground safety procedures, which must include provision for active supervision by staff and a method of maintaining resilient surfacing.

As CFA and PIRG advocates have seen time and time again, the key to successful advocacy is persistence. On-going follow-up is needed to ensure that old playgrounds get audited and renovated and that new playgrounds meet the current safety requirements. Getting a law passed is a great first step — and a big one — but it is not enough. Without continued, active advocacy, it is unlikely that the necessary safety inspections will take place or that funds will be made available to make playgrounds as safe as possible.

CONCLUSION

Deaths and injuries related to public playground equipment — deaths and injuries that could be prevented — continue to occur. While no play area or piece of equipment can be made completely safe, careful design minimizes injuries and saves children's lives.

It behooves state and local authorities to make public playgrounds safer. Nationally, according to one estimate, the health care costs caused by playground injuries in 1995 were $1.2 billion for children younger than 15 years old. Another estimate showed that in Massachusetts alone, a state with a population of only about 6 million, the lifetime health care costs caused by playground injuries could be conservatively estimated at $10 million each year.[31] An analysis of 215 lawsuits against recreational programs in New York and New Jersey between 1974 and 1987 found that playgrounds led all categories of such suits, and of the 54 (one-quarter of the total) against playgrounds, the primary problem areas included "provision and maintenance of proper surfacing under apparatus and in play areas."[32]

In addition, an important study by the University of North Carolina at Chapel Hill School of Public Health has shown that the law passed in North Carolina in 1996, which requires that all new playground equipment and surfacing in childcare facilities must conform to CPSC guidelines, has reduced playground injuries. The study documented a 22% decrease in the rate of injuries at childcare centers in North Carolina.[33] Dr. Jonathan B. Kotch, professor of maternal and child health and author of the study stated, "To our knowledge, this is the first time anyone in the United States has been able to associate a real decline in the risk of child injuries with strengthening regulations for . . . childcare playgrounds."[34]

Despite the high number of hazardous playgrounds found in this survey, the situation is not hopeless. Playgrounds can be built safely ***and*** provide lots of fun and challenges for children. But more should be done to reach this objective. CFA and PIRG offer the following recommendations:

(1) States and local governments:

Adopt CFA's "Model Law on Public Play Equipment and Areas."[35]

The requirements of the model law are separated into three sections.

- Requirements applicable to *all* play areas and equipment,
- Requirements applicable to play areas and equipment intended for use by pre-school children, aged 2 through 5 years, and

- Requirements applicable to play areas and equipment intended for use by school-age children, aged 5 through 12 years.

For the greatest level of safety, all applicable provisions in the model law should be adopted. However, it is possible for a section or subsection to be adopted depending upon need. A child care licensing entity, for example, might adopt only the general and preschool-age requirements, if it only regulates centers serving children five and under. The protective surfacing provisions are also suitable for adoption alone.

(2) Parents, school administrators, child care providers and park personnel:

Evaluate your local playgrounds and work to make each playground safer.

As a first step in evaluating the safety of a playground, parents and others can use CFA's Parent Checklist. It is available for free to individuals by sending a self-addressed stamped envelope to: Parent Checklist, P. O. Box 12099, Washington, D.C. 20005-0999.

It is also available on the CFA web site, www.consumerfed.org. If any hazards are found, the owner or operator of the playground should be contacted and corrective action should be demanded.

END NOTES

[1] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, #H021011142A.
[2] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, #C0175003A.
[3] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, #H0150277A.
[4] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, #X01B5357A.
[5] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, #F01B6001A.
[6] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, #H0190258A.
[7] Playground Equipment, 2000-Present, Reported Incidents, U.S. Consumer Product Safety Commission-National Injury Information Clearinghouse, # C0065005A.
[8] Playground Equipment 2000-present, Incident Investigations, U.S. Consumer Product Safety Commission - National Injury Information Clearinghouse, #000413HCC3212.
[9] *Los Angeles Times*, June 26, 2000.
[10] Most recent CPSC data indicates that 247,000 children were injured on all playgrounds in 2001. Of all playground injuries, CPSC has determined that 75.8% occur on public playgrounds. Therefore, injuries on public playgrounds necessitating emergency room treatment reached almost 190,000 in 2001.
[11] Much of the information, injury data, and technical criteria presented here come from CFA's report and model law, "Report and Model Law on Public Play Equipment and Areas" (Morrison & Fise, 1998). This document adds survey data reporting on the safety of American playgrounds as a follow up to the CFA report.
[12] Medical Letter on the CDC and FDA, vol. 18, August 26, 2001. (2001 WL 17553876).
[13] From Center for Disease Control Fact Sheet on Playground Injuries, found at www.cdc.gov/nicpc/factsheets/plagr.htm (citing Consumer Product Safety Commission (CPSC). National Electronic Injury Surveillance System 1990-94. Washington, DC: CPSC).
[14] All of the statistics from this section are from Tinsworth, Debra K. & McDonald, Joyce E., Special Study: Injuries and Deaths Associated with Children's Playground Equipment, U.S. Consumer Product Safety Commission,(April, 2001). This study is available on the web at *http://www.cpsc.gov/LIBRARY/Playgrnd.pdf*. Deaths due to falls are under-reported in the CPSC's data. (*See* Figure 4, Hazard Patterns Associated with Playground Equipment Related Deaths, p. 20)
[15] *Ibid*, p. 11.
[16] *Ibid*, p. 11. One percent of injuries due to falls occurred on an unidentified surface.
[17] *Ibid*, p. 12.
[18] *Ibid*, p. 5.
[19] *Ibid*, p. 6.
[20] *Ibid*, p. 6.
[21] *Ibid*, p. 11.
[22] *Ibid*, p. 11.
[23] The data source for this section, "Climbers and Slides," is Tinsworth, Debra K. & McDonald, Joyce E., Special Study: Injuries and Deaths Associated with Children's Playground Equipment, U.S. Consumer Product Safety Commission,(April, 2001). This study is available on the web at *http://www.cpsc.gov/LIBRARY/Playgrnd.pdf*.
[24] *Ibid*, Tble A3. Injuries Associated with Public Playground Equipment, Age of Victim by Type of Equipment, p. 30.
[25] *Ibid*, Tble A1. Injuries Associated with Public Playground Equipment, Type of Equipment Hazard Pattern, p. 28.

[26] American Wood Preservers Institute (AWPI) Web site, Pressure Treated Wood Fact Sheet, http://www.preservedwood.com/preswood/preswood.html.

[27] Lee, Brian C., *Dislodgeable arsenic on playground equipment wood and the estimated risk of skin cancer*, Memorandum, Washington, DC, U.S. Consumer Product Safety Commission, 1990; and Riedel, D., D. Galarneau, J. Harrison, D.C. Gregoire, and N. Bertrand, *Residues of arsenic, chromium and copper on and near playground structures built of wood pressure-treated with "CCA" type preservatives,* Ottawa, Canada: Environmental Health Center, Health and Welfare Canada, 1991.

[28] Cox, Caroline, *Chromated Copper Arsenate,* Journal of Pesticide Reform, vol. 11, no. 1, Spring 1991.

[29] *Ibid.* (citing World Health Organization, *Arsenic: Environmental Health Criteria 18*, Geneva, Switzerland, Published under the joint sponsorship of the United Nations Environment Program, the International Labor Organization, and the World Health Organization, 1981.

[30] The source of the local information is www.safechild.net, a project of Consumer Federation of America Foundation. The state and local playground information can be found at http://www.safechild.net/for_advocates/advocates_playgrounds.html.

[31] Personal communication with Massachusetts Dept. of Health, 5/16/95.

[32] "Lawsuits Brought against Recreational Programs," *Recreational Newsletter,* National Safety Council, March/April 1988.

[33] *NC Playground Regulations Resulted in Fewer Injuries*, Associated Press Newswires, Chapel Hill, North Carolina, January 19, 2002.

[34] *Ibid.*

[35] The CFA model law (second addition) represents what was at the time of publication (1998) the state of the art in safety and design for public playgrounds. As more testing is completed and injury data collected, these provisions may at some point become outdated. Entities adopting these provisions should incorporate into their requirements a system of review to assure that these provisions are updated as necessary. A copy of the CFA Model law can be found on line at www.safechild.net.

CFA/PIRG Playground Safety Survey -- Spring 2002

Playground Name: _____ Location (cross streets): _____

City/State: _____ Date Surveyed: _____

Surveyor/Organization/Phone Number: _____

NOTE: Please make as many copies of this survey as you have playgrounds to check; complete a separate survey for each playground. You will need a measuring tape and a strong stick (to dig to the bottom of loose-fill surfaces) to complete this survey. As necessary, please continue your comments on the reverse side.

1. PROTECTIVE SURFACING

It is extremely important to note what the surface is under and around play equipment. If the surfacing type varies (i.e., there is more than one surface on the playground), please note what type of surface is under each piece of play equipment. For example, you may find concrete under a climber but hardwood chips under the swings.

a. What type of surfacing is under and around the play equipment? Please circle.

Concrete Asphalt Grass Soil

Loose-fill materials: Hardwood Chips Shredded Mulch Sand Pea Gravel Shredded Tires

Rubber Tiles or Unitary Synthetic Surface

Other: _____

b. If the surfacing is a loose material, such as hardwood chips, shredded mulch, sand, pea gravel or shredded tires, use your yardstick or ruler to measure how deep it is, making several measurements in different spots.

Depth (at deepest point):_____inches Does this depth appear consistent throughout the play area? YES NO

Comments: _____

2. FALL (USE) ZONES

The fall or use zone is the area under and around a piece of play equipment where a child might fall. The fall zone should (1) have protective surfacing and (2) be free of other equipment or obstacles onto which a child might fall. Protective surfacing is covered above; the questions below address whether the area around the equipment that is free of obstacles and other equipment provides a large enough fall zone. If the fall zone is large enough (as described below) but does not have adequate protective surfacing (i.e., hardwood chips are only 3 inches deep), please note that problem above and/or below.

a. *Fall Zone for climbing equipment and slides*: does the fall zone extend a minimum of 6 feet in all directions from the perimeter of the equipment? YES NO

AND, if the height of adjacent pieces of equipment (such as an independent climber and an indepement slide) exceeds 30 inches, is the minimum distance between the two separate pieces at least 9 feet? YES NO

b. *Fall Zone for swings with conventional, strap-type seats (not tot seats)*: Does the fall zone extend a minimum of 6 feet from the perimeter of the support structure on each side as well as a minimum distance of twice the height of the pivot point in front of and behind the swing seats? The fall zone on the sides of a swing structure may overlap with that of an adjacent swing structure (minimum 6 ft. spacing). YES NO

Comments: _____

Playground Name/ Location:_____

3. PLAYGROUND EQUIPMENT SURFACE MATERIAL

a. Is there any peeling, chipping or cracking paint on any equipment surface? YES NO

b. Is playground equipment made of wood other than red wood (reddish) or cedar (silvery gray)? YES NO

4. EQUIPMENT HEIGHT

Limiting the height of play equipment is an essential means of preventing severe fall-related injuries.

a. *Climbing equipment:* what is the height of the highest climbing member, such as a rung or platform? _____

b. *Slides:* what is the height of the slide entrance where the child enters the slide chute? _____

c. *Swings:* is the height of the pivot point/swing beam higher than 8 feet? YES NO

5. SWINGS

a. Are any swing seats constructed of heavy, rigid materials such as wood or metal? YES NO

b. Are any swing structures attached to other play equipment, such as a slide or climber? YES NO

c. Are there more than two swing seats in any one section (bay) of the swing structure? YES NO

d. Are infant/tot seats suspended in the same section (bay) of the swing structure as regular seats? YES NO

e. Is the horizontal distance between adjacent swings at least 24 inches? YES NO

f. Is the horizontal distance between the swing seat and any adjacent support structure at least 30 inches? YES NO

6. HEAD ENTRAPMENT HAZARDS

Any opening -- except those where the ground is the lower boundary -- with an interior dimension between 3.5 and 9 inches may cause head entrapment, and such incidents can result in strangulation. Entrapment may occur when a child enters an opening, either head first or feet first, but cannot withdraw his or her head because the opening is too small. For example, on a piece of climbing equipment, the space between two climbing rungs on a ladder or the space between the lower edge of a protective barrier and the platform may present head entrapment hazards if the opening is in the hazardous range between 3.5 and 9 inches. Head entrapment criteria apply to all types of openings on all types of equipment, except where the ground is the lower boundary of the opening.

Does the play equipment have any openings with an interior dimension between 3.5 and 9 inches which may cause head entrapment? If yes, please describe below. YES NO

Comments: _____

7. CLOTHING ENTANGLEMENT HAZARDS

Entanglement incidents can result in strangulation. Look for open "S" hooks, especially on swings. Look for gaps, protrusions, or equipment components which may act as hooks or catch points, especially at the top of slides.

Does the play equipment have any entanglement hazards on which children may catch clothing or anything else around their neck? YES NO

Comments: _____

8. DANGEROUS EQUIPMENT -- Does the playground have any of the following equipment?

a.	Chain or Cable Walks	YES	NO	d.	Swinging Exercise Rings/Trapeze Bars	YES	NO
b.	Multiple Occupancy Swings/Gliders	YES	NO	e.	Rope Swings (Tire Swings are exempt)	YES	NO
c.	Animal Swings	YES	NO	f.	Individual Climbing Ropes	YES	NO

CFA PARENT CHECKLIST

How Safe is Your Local Playground?

Too many children suffer injuries on public playground equipment. It is estimated that nearly 150,000 children are treated in hospital emergency departments annually for injuries sustained while playing on public playground equipment. And sometimes these injuries are fatal; at least 15 children die each year because of playground-related incidents.

Extensive research has been conducted to identify the playground hazards which cause injuries and death. The following checklist can be used to evaluate the general safety of your local playground. Check the playgrounds where your children play -- including the equipment at your local schools, parks, community centers, churches, and child care centers -- to see whether they present dangerous hazards.

1. Is there a lack of protective surfacing under or around play equipment?

Protective surfacing is the most critical safety factor on playgrounds because approximately 75% of all injuries are caused by falls.

Hard, paved surfaces such as concrete and asphalt as well as earth surfaces such as grass, soil, and hard packed dirt are not acceptable for use under and around play equipment. None of these surfaces provides adequate protection against fall-related injuries. Falls onto concrete or asphalt from as low as 2 inches can cause life-threatening head impact injuries.

Acceptable protective surfacing materials include:

- Loose-fill surfacing materials -- such as wood chips, shredded bark mulch, sand, and pea gravel -- when installed and maintained at depths of at least 9 to 12 inches and provided that they are not wet or compacted.
- Unitary synthetic surfacing materials -- including some premolded rubber tiles and pour-in-place systems.

2. Are pieces of play equipment too close together?
Is there a lack of protective surfacing where children might fall?

A fall zone is the area under and around a piece of play equipment where a child might fall. The fall zone should have protective surfacing and be free of other equipment or obstacles onto which a child might fall.

- If two pieces of adjacent stationary play equipment are no more than 30 inches in height, their fall zones may overlap with a minimum distance between structures of 6 feet. If adjacent equipment is higher than 30 inches, the minimum distance between structures should be 9 feet.
- For climbing equipment, merry-go-rounds, seesaws, and spring rockers, the fall zone should extend a minimum of 6 feet in all directions from the perimeter of the equipment.
- For slides, the fall zone behind the access ladder and to the sides of a slide should extend a minimum of 6 feet from the perimeter of the equipment. The fall zone in front of the exit of a slide should extend a minimum distance of 6 feet from the end of the slide chute or for a distance of H+4 feet, whichever is greater. H is the height of the slide platform.
- For swings with conventional seats, the fall zone should extend a minimum of 6 feet from the perimeter of the support structure on each side as well as a minimum distance of twice the height of the pivot point in front of and behind the swing seats. The fall zone on the sides of a swing structure may overlap with that of an adjacent swing structure. But the fall zone in front of and behind the swings may not overlap with any other fall zone.

3. Is there any equipment too high above ground?

The highest climbing rung or platform on climbing equipment or the height of the top of a slide, for example, should not exceed:

- 4 feet above the protective surfacing when designed for preschool-age children.
- 6 feet above the protective surfacing when designed for school-age children.

4. **Do elevated play surfaces -- such as platforms, bridges, walkways, and ramps – lack adequate guardrails or protective barriers to prevent falls? Can children inadvertently fall off high elevated surfaces?**

5. **Are swings too heavy, too close together, or too close to support structures?**

- Swing seats should not be made of wood, metal, or any other heavy, rigid materials. Heavy, hard hitting swings -- including animal swings, multiple occupancy swings such as gliders (but not tire swings), swinging exercise rings, and trapeze bars -- may cause life-threatening head impact injuries.
- No swing structures should be attached to other play equipment or composite structures.
- No more than two swing seats should be suspended in the same section of the support structure.
- Infant/tot seats should not be suspended in the same of a swing structure as regular swing seats.
- Swings with conventional seats or tot seats should have horizontal clearances of at least 24 inches between adjacent seats and 30 inches between the swing seat and an adjacent structural component.

6. **Does the play equipment have any head entrapment hazards?**

Any opening -- except those where the ground is the lower boundary -- with an interior dimension between 3.5 and 9 inches may cause head entrapment, and such incidents can result in strangulation. Entrapment may occur when a child enters an opening, either head first or feet first, but cannot withdraw his or her head because the opening is too small.

7. **Does the play equipment have any entanglement hazards on which children may catch clothing or anything else around their neck?**

Entanglement incidents can result in strangulation.
- Look for open "S" hooks, especially on swings.
- Look for gaps, openings, holes, protrusions, or equipment components which may act as hooks or catch points, especially at the top of slides.

8. **Does the play equipment have any sharp points, corners, or edges?**

9. **Does the play equipment have any hardware or components which are dangerous protrusions or projections?**

10. **Does the play equipment have any exposed moving parts or other junctures which create dangerous pinch, crush, or shearing points?**

11. **Does the play equipment or area have any exposed concrete footings or environmental obstacles, such as rocks or roots, which create trip hazards and may cause impact injuries?**

12. **Does the play equipment show any signs of deterioration or corrosion?**
Does the play area lack maintenance or appear to have been vandalized?

- Look for loose splinters, large splits, and decay on wood components, rust or paint that is peeling, chipping, or cracking on metal components, and splitting or cracking on plastic components.
- Look for missing or damaged equipment components, checking items such as handholds, guardrails, swing seats, and benches.
- Special attention is warranted for deterioration and corrosion on structural components where they contact the ground; look for any emerging anchoring problems that may cause instability.

If the answer to any of the questions above is yes, contact the owner or operator of the playground -- such as the school principal, the local Parks and Recreation Department, or the child care provider. Let them know that you found hazards and that their play equipment and playground are not safe. Share the results of this survey and demand that corrective action be taken immediately so that children do not get hurt. Hazardous equipment should be upgraded or removed. Most importantly, ensure that adequate protective surfacing gets installed and maintained.

A more detailed evaluation of the playground's safety can be completed using Consumer Federation of America's 1998 *Report and Model Law on Public Play Areas and Equipment*. For a copy of this report, send a check or money order for $40 to Consumer Federation of America, 1424 16th Street, NW, Suite 604, Washington, DC 20036.

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